

a center body suspended in said piezoelectric suspension structure; and  
a plurality of signal wires arranged such that at least one of said signal wires is connected to each of said elastic sectors of said suspension structure, said suspension structure and said center body being operable to substantially simultaneously transmit mechanical vibrations and receive mechanical vibrations.

17. (New) The transducer of claim 16, wherein at least a first one of said elastic sectors of said suspension structure is operable to transmit mechanical vibrations while at least a second one of said elastic sectors of said suspension structure receives an echo vibration signal based on the mechanical vibrations transmitted by said at least a first one of said elastic sectors.

18. (New) The transducer of claim 17, wherein said center body and said suspension structure are arranged so that when said center body is moved by being pushed against a surface, said elastic sectors of said suspension structure are tensioned so as to be slanted with respect to a plane of said frame, thereby enhancing a directivity of signal emission and signal reception.

19. (New) The transducer of claim 16, wherein said center body includes a piezo-element for transmitting mechanical vibrations.

20. (New) The transducer of claim 19, wherein said piezo-element comprises a first piezo-element, said center body further including a second piezo-element for receiving mechanical vibrations.

21. (New) The transducer of claim 20, wherein said first piezo-element is operable to transmit ultrasound signals having a frequency range of 5 MHz to 10 MHz, and said second piezo-element is operable to receive reflections of the ultrasound signals transmitted by said first piezo-element so as to perform an echo Doppler investigation.

22. (New) The transducer of claim 21, wherein said first piezo-element is operable to transmit the ultrasound signals and the second piezo-element is operable to receive the reflections of the ultrasound signals, simultaneously with auscultation by at least one of said elastic sectors of said suspension structure.

23. (New) The transducer of claim 20, wherein a group of said elastic sectors are operable to receive mechanical vibration signals, said group of elastic sectors being interconnected for electronic combination of signals and cancellation of undesired frequencies.

24. (New) The transducer of claim 23, wherein said second piezo-element is connected with said group of elastic sectors for electronic combination of signals and cancellation of undesired frequencies.

25. (New) The transducer of claim 20, wherein said frame comprises an inner frame, a group of said elastic sectors being operable to receive mechanical vibration signals, said transducer further comprising an outer frame including an outer elastic suspension structure suspending said inner frame, said outer suspension structure having a third piezo-element for generating receive signals, said third piezo-element being connected with said group of elastic sectors for electronic combination of signals and cancellation of undesired frequencies.

26. (New) The transducer of claim 25, wherein said third piezo-element is further connected with said second piezo-element for electronic combination of signals and cancellation of undesired frequencies.

27. (New) The transducer of claim 20, wherein a group of said elastic sectors is operable to receive mechanical vibration signals, said transducer further comprising an external sensor for generating receive signals, said external sensor being connected with said group of elastic sectors for electronic combination of signals and cancellation of undesired frequencies.

28. (New) The transducer of claim 16, wherein a group of said elastic sectors are operable to receive mechanical vibration signals, said group of elastic sectors being interconnected for electronic combination of signals and cancellation of undesired frequencies.

29. (New) The transducer of claim 28, wherein said center body includes a piezo-element for receiving mechanical vibrations, said piezo-element being connected with said group of elastic sectors for electronic combination of signals and cancellation of undesired frequencies.

30. (New) The transducer of claim 16, wherein said frame comprises an inner frame, a group of said elastic sectors being operable to receive mechanical vibration signals, said transducer further comprising an outer frame including an outer elastic suspension structure suspending said inner frame, said outer suspension structure having a piezo-element for generating receive signals, said piezo-element being connected with said group of elastic sectors for electronic combination of signals and cancellation of undesired frequencies.

31. (New) The transducer of claim 30, wherein said piezo-element comprises a first piezo-element, said center body including a second piezo-element for receiving mechanical vibrations, said first piezo-element being further connected with said second piezo-element for electronic combination of signals and cancellation of undesired frequencies.

32. (New) The transducer of claim 16, wherein a group of said elastic sectors is operable to receive mechanical vibration signals, said transducer further comprising an external sensor for generating receive signals, said external sensor being connected with said group of elastic sectors for electronic combination of signals and cancellation of undesired frequencies.

33. (New) The transducer of claim 16, further comprising a controller electrically connected to said elastic sectors for phasing signals to and from said elastic sectors so as to achieve directional emission and reception.

34. (New) The transducer of claim 16, further comprising a tensioning structure connected to said center body at a rear side of said suspension structure, said tensioning structure being operable to pull said center body toward the rear side so as to tension and angle said elastic sectors.

35. (New) The transducer of claim 34, wherein said tensioning structure is fixed to said frame.

36. (New) The transducer of claim 34, wherein said frame comprises an inner frame, said transducer further comprising an outer frame including an outer elastic suspension structure suspending said inner frame, said tensioning structure being fixed to said outer frame such that said tensioning structure is operable to pull said center body toward the rear side so as to tension and angle said elastic sectors and said outer elastic suspension structure.